[Version 1.0]
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Revision History

[MALLINCAM SDI User Manual]

This document will introduce you to the wonders of the MallinCam SDI Camera. It will include instructions on how to connect the Mallincam SDI to your computer along with explanations of the camera's various settings. Imaging techniques with the various hardware and software options will be covered along with how to broadcast the output of the Mallincam SDI camera on the Internet. The standard Composite Video output will be discussed along with hints and suggestions on how to resolve any problems that you encounter with this camera. Enjoy the adventure with Rock Mallin's Mallincam SDI Video camera, which will introduce you to the amazing field of Real Time Mallincam SDI video imaging and broadcasting.

Version	Date	Revision Description
1.0	11/16/2014	Template Creation for MALLINCAM SDI Camera

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1. Introduction

Welcome to the world of the Mallincam SDI Camera. Your purchase will provide you with years of discovery and adventure as you view, record, share, and broadcast the wonders of the Solar System. The Mallincam SDI is a professional video camera that can provide broadcast quality live images in the HD-SDI format along with standard quality video for non-broadcast needs.

The Mallincam SDI camera uses a true HD sensor and SDI Digital output for unsurpassed image quality. At 2.1 MP sensor, the all Ceramic Panasonic Sensor use the latest in Technology offered by Panasonic using the new 1/3 Inch 2.1 MP High Speed Maicovicon MOS sensor making it ideal for planetary, Lunar and Solar Imaging under live condition on a monitor or through the SDI uncompressed Digital format for image recording.

This document will guide you in the connection options of the Mallincam SDI to your computer, along with recommendations on configuring the camera for specific Solar System objects. This manual is the work of the MallinCam Mallincam SDI users before me. I have borrowed their ideas and even some of their documents and have placed them in the manual so that we have everything is in one place. Special thanks to **Jack Huerkamp** for all the preliminary work he has done with this camera.

So thank you for your purchase, and let the adventure begin

The Contents of the MALLINCAM SDI Package

Depending upon the MALLINCAM SDI Model purchased, the contents may vary, but all MALLINCAM SDI Deluxe cameras include the following standard equipment:

MallinCam SDI Deluxe Package:

- Mallincam SDI camera body
- BNC to RCA adapter
- 1.25" eyepiece adapter
- SVBS 10 meter cable
- 120 volts AC to 12 volts DC Regulated power supply

These attachments will provide you with the ability to connect the Mallincam SDI Video camera to your telescope, power it using to a 120V AC power source, and displaying your image on any device that accepts analog or SDI video. See the **Appendix** for a list of other accessories available for the Mallincam SDI Camera.

The Camera (Just the Facts)

The MallinCam SDI Camera is a video camera that provides near Real Time images of brighter Deep Sky Objects, Planetary, Lunar, and Solar. This instrument contains the following specifications:

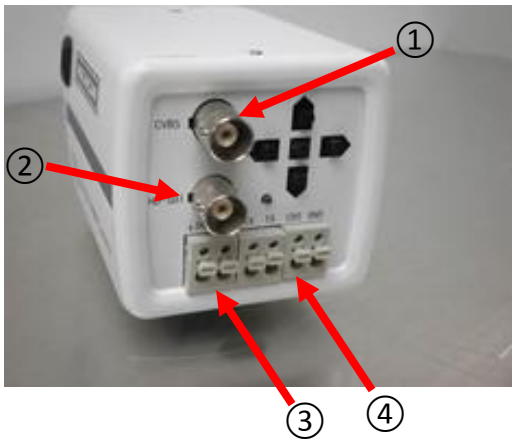
Model	MALLINCAM SDI
Image Sensor	Panasonic 1/3 Inch 2.1 MP High Speed Maicovicon MOS sensor
CCD Pixels:	2010 (H) X 1108 (V) Total Pixels 2.75µm × 2.75µm (V) Pixel size 1944 (H) X 1092 (V) Active Pixels
CCD Size:	1/3“ , 5.59mm (H) × 4.68mm (V)
Video Output Format:	NTSC or PAL
HD-SDI Video	BNC Female Connector
Composite Video	BNC Female Connector
Gain Control:	Auto/Manual
Exposure Control:	Auto/Manual
Auto Iris:	ELC, ALC
Fix Shutter (seconds)	1/60000, 1/30000, 1/16000, 1/8000, 1/4000, 1/2000, 1/1000, 1/500, 1/240, 1/120, 1/60, 1/30
Extended Shutter	OFF, X2, X3, X4, X5, X6, X7, X8
Gamma Selection	0.45, 0.50, 0.55, 0.60, 0.65
White Balance	-Automatic -Manual
Communication Protocol	Pelco
Operating Temperature	-25C to +50C (-13^{o}F to 122^{o}F)
Power Supply	12±1V DC at 1A
Dimensions	4 inches (L) x 2.5 inches (W) x 2.5 inches (H)
Weight	10.2 ounces

The Camera (its Anatomy)

The Mallincam SDI camera is a rectangular based camera with a rear connection ports for power, video and communications and a front c-mount opening. It is 4" long by 2.5" tall and 2.5" wide. The camera weighs in at about 11 ounces (290 grams).

2. Making Connections

The MALLINCAM SDI Camera (Connection Diagram)



1	Composite Video Out (BNC)
2	SDI Video Out (BNC)
3	12V Power in (12V)
4	RS485 Communication

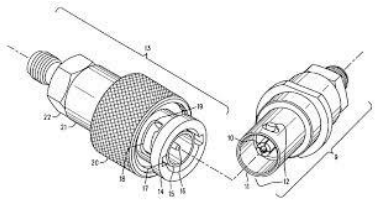
Connecting the Mallincam SDI to Monitor

The MallinCam SDI provides two video outputs: Composite and SDI both of which utilize a BNC connector. Since composite and SDI signals are different formats, with HD-SDI packing a lot of data, different types of video cable are recommended. Rock provides the composite cable with the Deluxe Package, which you can use for both composite and SDI, but if you require a long length of cable for SDI output, you can Google SDI cables to locate a supplier of dedicated SDI cable for you to use. This dedicated SDI cable will provide the best image possible with the Mallincam SDI.

Composite Video

The Composite Signal is obtained by connecting the included 10m MallinCam Video Cable from the Video-Out adapter of the camera (see ① in the connection diagram) to the Composite Video-In Adapter on your monitor (*since in most monitors, the Composite Video-In connector is a RCA style, MallinCam provides a BNC to RCA adapter to facilitated that connection*) or composite adapter on your **Video Capture Device** (MCV-1) if you are using a computer.

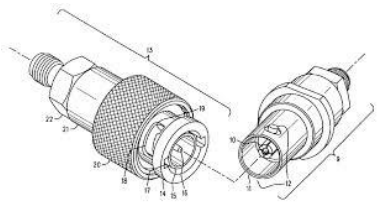
To connect, just align the two little openings on the BNC cable (*male*) with the two notches on the adapter's BNC (*female*) connector, push and twist so the notches slide into place. This locks the connector to the Mallincam cable.



SDI Video

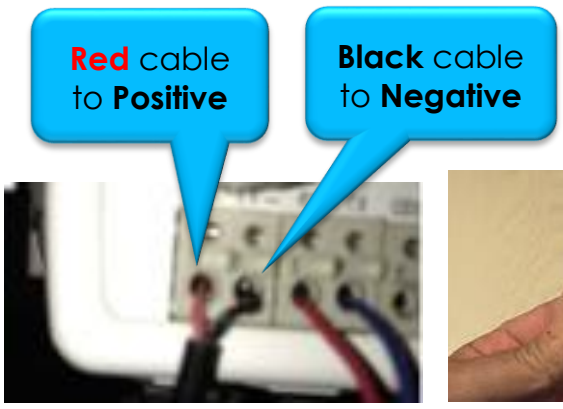
The SDI Signal is obtained by connecting the included 10m MallinCam Video Cable (or dedicated SDI cable) from the SDI-Out adapter of the camera (see ② in the connection diagram) to the SDI Video-In Adapter on your SDI monitor (since SDI input standard is the BNC, there is no need to use the included *BNC to RCA adapter*) or SDI adapter on your **Video Capture Device** (BlackMagic SDI Ultra Studio, Magewell SDI) if you are using a computer.

To connect, just align the two little openings on the BNC cable (*male*) with the two notches on the adapter's BNC (*female*) connector, push and twist so the notches slide into place. This locks the connector to the cable.



Power

The Mallincam SDI camera requires 12V 1amp power either from an AC to DC converter or 12V DC power supply. Just connect the two power connect cables into the matching two Power Input plugs on the back of the Mallincam SDI. The other end plugs into the Power In connecter on the end of the 10m cable on the included Mallincam dual power/video cable.



Back of Mallincam SDI. See ③ on Connection diagram.

Included Mallincam Power Cable.

Included Mallincam 12V DC Power Adapter.

Connecting the MALLINCAM SDI to your Computer for Video.

Composite Video:

Requirements:

- Computer with video display software such as AMCAP.
- USB Video capture adapter such as MallinCam MCV.
- Mallincam dual power/video cable.
- MALLINCAM SDI AC to DC power adapter.
- MALLINCAM SDI camera.

Software Requirements:

You will need any software package that can display an image from your video capture device. Some suggestions are:

- AMCAP
- SharpCap
- SplitCam
- ManyCam
- WebCamMax

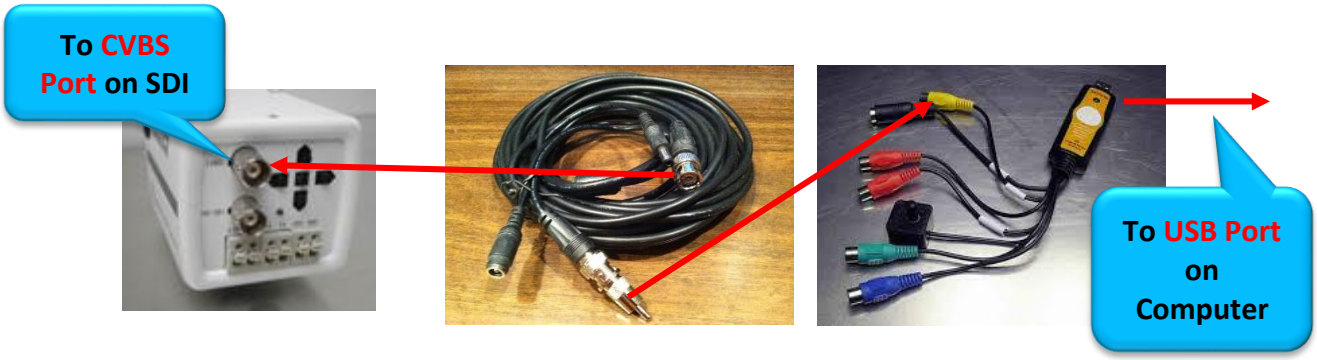
Each software has its pros and cons, depending upon what you require the software do. Using SplitCam, ManyCam, or WebCamMax will make it easier to broadcast your images on Night Skies Network (see section **Connecting the Night Skies Network (NSN)**) if that will be a direction you are thinking of taking.

Hardware Requirements

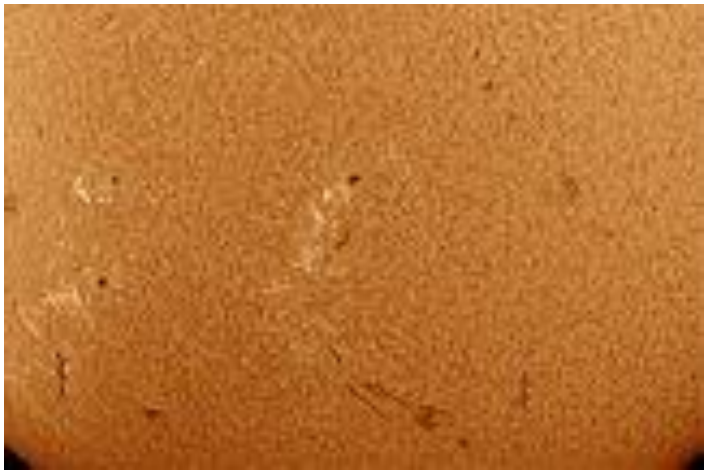
- A **USB Video Capture Device**, such as MallinCam's **MCV.** This device will allow the output from the MALLINCAM SDI (composite) to be captured and displayed by the software (see **Installing the MCV** in Appendix).

Attaching the Video Cable to MALLINCAM SDI Camera

Now you attach the Malincam SDI 10m composite cable (**RCA** adapter attached) to the USB Video Capture Device (**MCV**) that you are using for video input and attach the other end of the 10m cable to the CVBS connecter (**BNC**) on the MALLINCAM SDI Camera to allow for capture of the video signal.



Now all we need to do is start the video display software of your choice to display the image. Remember what ever software choice you made to display the image from the Mallincam SDI Camera, it will have an option that allows you to choose the Video Capture Adapter's driver (**x2828** for **MCV**). Once you chosen the driver, you should now see an image of what the Mallincam SDI Camera is capturing in the video window of your software.



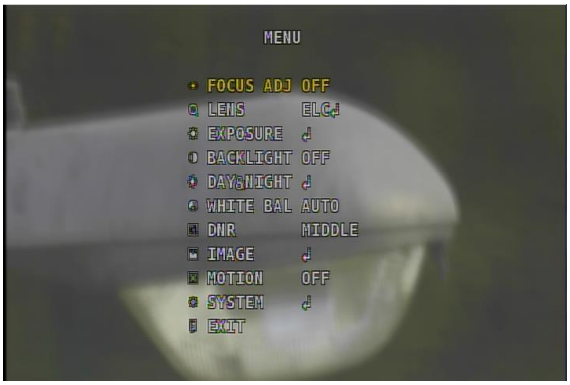
3. Operating the MALLINCAM SDI

Now is the time to do a quick check of the MALLINCAM SDI Camera to see if you can obtain a video signal. This walk through assumes you have a monitor with a Composite input capabilities (*or a Laptop with a Video Capture Device attached and configured along with Video Display Software*). Place your MALLINCAM SDI Camera on your telescope and point the telescope at a recognizable object. Power up your MALLINCAM SDI Camera and monitor (start your Video Display Software if you are using a Computer). It is best to check out your MALLINCAM SDI Camera in the daytime, so you can more easily check out the connections.

Upon Powering up the **SDI Camera, its** Menu will revert back to the last time you saved the settings. That is, when you last used the **EXIT** command on the **On Screen Menu**.

If you have connected everything correctly you should be seeing an image either on your monitor or in the image window of your computer's display software. Use the focus of the telescope to bring the image to focus.

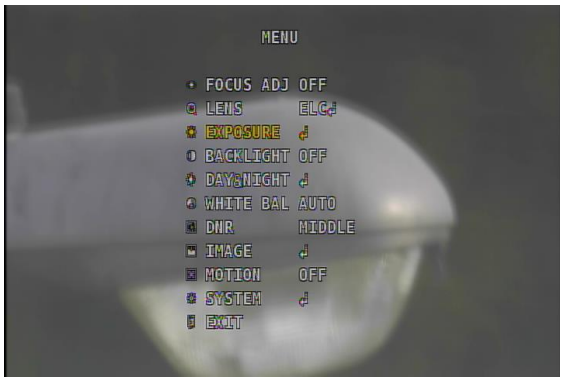
Press and release the **Centre Button** on the back of the MALLINCAM SDI. You should see the camera's **On Screen Menu** pop-up on top of your image with **FOCUS ADJ** Highlighted.



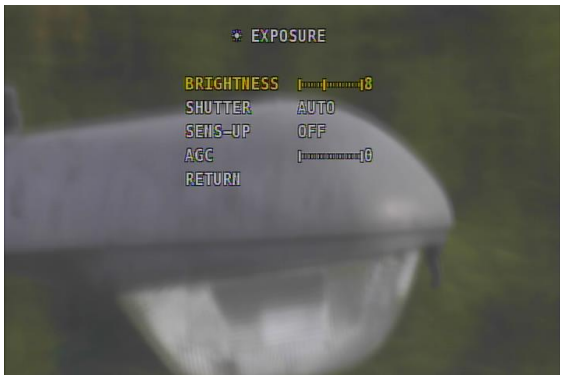
Note: There are two ways of fine tuning the brightness, contrast of the image. The first is using the SDI Camera Menu settings, and the second is using the brightness and contrast controls on your monitor (or software controls in your video capture software) the camera.

We want to adjust the **Brightness** and the **Exposure** of the Mallincam SDI to improve the image on the screen. With some experience with your software (or monitor), you will use a combination of MallinCam SDI controls, and Software controls to produce the best possible image.

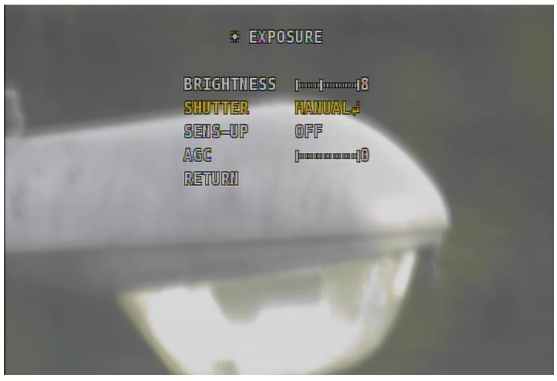
Press on the **Down Button** and the OSD Menu should highlight the **LENS** selection. Press the down button once more to highlight the **EXPOSURE** selection.



Now press the **Centre Button** on the back of the Mallincam SDI and you will be presented with the **EXPOSURE** Sub-Menu. The **BRIGHTNESS** selection will be highlighted. Using the **Left** or **Right Button** on the back of the camera, experiment with adjusting the brightness of the image.



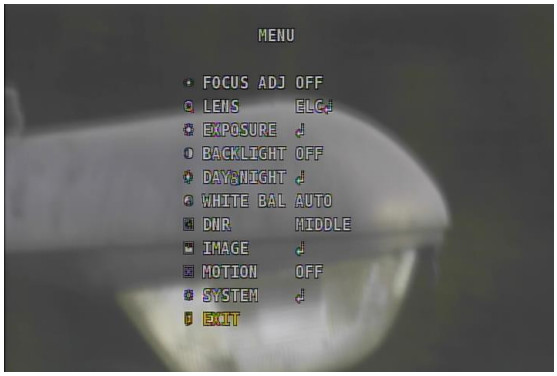
Press the **Down Button** to now select the **SHUTTER** selection (it should say **AUTO**)). Press on the **Right Button** until the choice changes to **MANUA**L. Now press on the Centre Button to enter into the Manual **Shutter Sub-Menu**.



With the **Shutter Sub-Menu** displayed, press the **Left** or **Right Button** to change the shutter time. Notice how the time effects the image. In the image to the right, I have set my Shutter to **1/120**.

Now press the **Down Button** to highlight the **RETURN** selection, and Press the **Centre Button** to return to the previous **Exposure Menu**.

On the **Exposure Menu**, press the **Down Button** enough times to highlight the **RETURN** selection and then press the **Centre Button**. You should now be at the **Main Menu**.



By pressing the **Down Button**, highlight the **EXIT** selection (the bottom choice). Now press the **Centre Button**. The **OSD Menu** will shut off, and the camera will save the current settings internally.

You should now recognize how easy it is to move through the Menu system of the Mallincam SDI. Now is a good time to review the detailed explanations of the on screen selections. Don't be afraid to experiment to see how a specific control affect your image. The more comfortable you become at manipulating the controls in the day time the easier it will be when you are under the night sky.

The MallinCam SDI is an imaging camera whose capabilities are in the hands of the user. As you will discover, when you become more confident with the camera, that your images will be the result of the combination both artistic prowess and scientific skill. Both of these attributes will become enhanced as your journey progresses and suggestions and advice from fellow explorers sharpen your skills and enrich your adventure.

One of the first pieces of advice we can offer you is that every user environment is different, the variety of outside obstacles, and sky brightness combined with the ever changing weather and seeing conditions makes it impossible to determine the precise setting for the SDI Camera. What we can do is provide suggestions that will get you started in the right direction. We recommend that you experiment and tweak the settings that we offer to see what works best for you. Patience will be your best friend as you learn what the Mallincam SDI can do, and what you can adjust. Do not be afraid to visit Night Skies Network or the Mallincam Group on Yahoo and ask questions.

The MALLINCAM SDI Camera OSD Settings

The following table will guide you in locating a specific **OSD** or **O**n **S**creen **D**isplay image control. Once you get the hang of locating the settings, it will be worth your time to peruse the Chapter **Understanding the OSD** to get a deeper comprehension how the adjustments will affect your image.

Always remember the suggested settings are a recommendation, as your viewing condition will affect the image, so don't be afraid to experiment.

Menu Choice	Sub Menu		
FOCUS ADJ	ON		
	OFF		
LENS	ELC	NORMAL	
		DEBLUR	
	ALC	INDOOR	
		OUTDOOR	
		DEBLUR	
EXPOSURE	BRIGHTNESS	0 to 20	
	SHUTTER	AUTO	
		MANUAL	1/60000, 1/30000, 1/16000, 1/8000, 1/4000, 1/2000, 1/1000, 1/500, 1/240, 1/120, 1/60, 1/30
		FLICKER	
	SENS-UP	OFF, X2, X3, X4, X5, X6, X7, X8	
	AGC	0 TO 20	
BACKLIGHT	OFF		
	HLC	LEVEL	0 TO 20
		MODE	ALL DAY
			NIGHT ONLY
	BLC	H-POS	0 TO 20
		V-POS	0 TO 20
		H-SIZE	0 TO 20
		V-SIZE	0 TO 20
DAY&NIGHT	MODE	COLOR	
		B&W	
		EXTERN	
		AUTO	
	IR LED	OFF	
		ON	
	ANTI-SAT	0 TO 20	
	EXTERN S/W	NONE	
	AGC THRES	0 TO 20	
	AGC MARGIN	0 TO 20	
	DELAY	LOW	
		MIDDLE	
		HIGH	
WHITE BAL	AUTO		
	AUTOext		
	PRESET		
	MANUAL	KELVIN	LOW
			MIDDLE
			HIGH
		R-GAIN	0 TO 20
		B-GAIN	0 TO 20
DNR	OFF		
	LOW		
	MIDDLE		
	HIGH		
IMAGE	SHARPNESS	0 TO 10	
	GAMMA	0.45, 0.50, 0.55, 0.60, 0.65	
	COLOR GAIN	0 TO 20	
	MIRROR	ON	
		OFF	
	FLIP	ON	
		OFF	

	D-ZOOM	1.0x TO 8.0x in steps of 0.1			
	ACE	OFF			
		LOW			
		MIDDLE			
		HIGH			
	DEFOG	OFF			
		ON	MODE	AUTO	
				MANUAL	
			LEVEL	LOW	
				MIDDLE	
				HIGH	
	SHADING	OFF			
		ON	WEIGHT 0% to 100%		
	PRIVACY	OFF			
		ON	ZONE NUM	0 TO 15	
			ZONE DISP	OFF	
				ON	
			H-POS	0 to 60	
			V-POS	0 to 40	
			H-SIZE	0 to 60	
			V-SIZE	0 to 40	
			Y-LEVEL	0 to 20	
			CR LEVEL	0 to 20	
			CB LEVEL	0 to 20	
MOTION	OFF				
	ON	SENSITIVITY	0 to 20		
		WINDOW TONE	0 to 6		
		DET H-POS	0 to 60		
		DET V-POS	0 to 40		
		DET H-SIZE	0 to 60		
		DET V-SIZE	0 to 40		
		MOTION OSD	OFF		
			ON		
		ALARM	OFF		
			ON		
SYSTEM	COM	CAM ID	0 TO 255		
		BAUDRATE	2400, 4800, 9600, 57600, 115200		
	IMAGE RANGE	USER	OFFSET	0 to 8	
		FULL			
		COMP			
	OUTPUT MODE	720P CROP, 720P, 1080P			
	MONITOR	0 to 3			
	FRAME RATE	25 FPS, 30 FPS			
	CVBS	NTSC, PAL			
	LANGUAGE	ENG, CHN, CHNISI, KOR, JPN, DEU, FRA, NLD, ESP, ITA			
	COLORBAR	OFF			
		ON			
	RESET	ON			

4. Understanding the OSD

On Screen Display (OSD) Menu

The following are a more detailed explanation on what function each control in the **MALLINCAM SDI Camera** performs. Remember use the suggested values as a guide, as your seeing conditions will dictate how the settings need to be set.

Note: You will have to use the **EXIT** command to save the setting adjustments you have made.

MENU MAIN

This is the main menu for the Mallincam SDI. It is from here that you select which setting you would like to adjust.

Menu selections include: **FOCUS ADJUSTMENT LENS, EXPOSURE, BACKLIGHT, DAY&NIGHT, WHITE BALANCE, DNR, IMAGE, MOTION, SYSTEMING**.

FOCUS ADJ

This function will help you to make focus easier. After fixing the camera on an object, then when you adjust the focus on the telescope, an orange bar means camera is not focused. A green bar means the camera is in focus. The smaller green bar is, the better focus. Not activated for astronomy usage.

LENS

This setting allows you to set the LENS to one of two adjustments for controlling the electronic exposure:

- **ELC (Electronic Light Control)**
- **ALC (Auto Level Control)**

We recommend using **ELC** at **NORMAL**

ELC

This causes the camera to modify the bias voltage on the CCD chip, resulting in a variable light sensitivity

Provides two settings:

NORMAL

Set as the default for astronomy applications.

DEBLUR

DEBLUR helps prevent blurred movement of objects on the screen. No used with astronomical applications.

ALC

Since the SDI is used with a fixed lens (the telescope), the ALC command will not affect the image. The ALC command provides you with 3 Options:

INDOOR

Not used astronomy applications.

OUTDOOR

Not used astronomy applications.

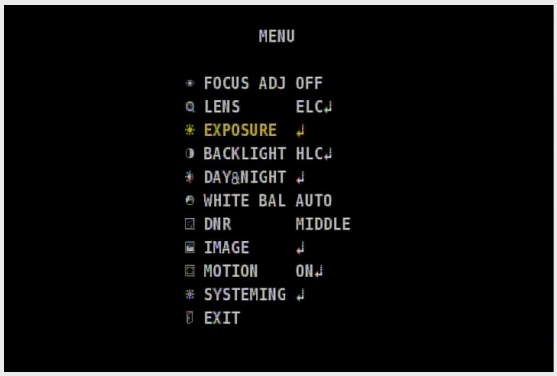
DEBLUR

DEBLUR helps prevent blurred movement of objects on the screen. No used with astronomical applications.

EXPOSURE

This command allows you to control all aspects of the Exposure. From here you can adjust the:

- BRIGHTNESS
- SHUTTER
- SENS-UP
- AGC



BRIGHTNESS

This control allow you to adjust the Brightness of the image. The values range of 0 to 20.

SHUTTER

The **SHUTTER** control has 3 settings:

- AUTO
- MANUAL
- FLICKER

AUTO

The **AUTO** setting allows the **Mallincam SDI** to automatically make adjustments to the shutter speed to provide what it believes is the best setting.

MANUAL

The **MANUAL** mode in the **SHUTTER** setting allows you to adjust the speed thus giving you more control.

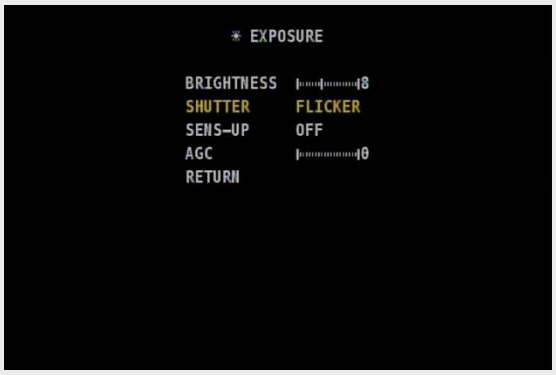
You can set the Shutter Speed in seconds to:

1/60000, 1/30000, 1/16000, 1/8000, 1/4000, 1/2000, 1/1000, 1/500, 1/240, 1/120, 1/60, 1/30

Use this mode to adjust you image to suit your needs.

FLICKER

When the **FLICKER** mode is selected the camera attempts to reduce any image flicker.



SENS-UP

SENS-UP acts as a Digital Slow Shutter. It will enhance the available like by increase the exposure by a range of factors.

The available Ranges are:

- OFF
- X2
- X3
- X4
- X5
- X6
- X7
- X8

Note: SENS-UP only works when the **SHUTTER** is in **AUTO** or **FLICKER** Mode.

AGC

This is the **A**utomatic **G**ain **C**ontrol for the SDI, which amplifies the video signal whenever it falls below the set value. As the **AGC** level increases, the overall screen images gets brighter (including the noise).

Works best if you have **SHUTTER** set to **MANUAL**.

BACKLIGHT

When there is a strong light behind the object, the setting **BACKLIGHT** to **ON** will help provide a clear image of both the background and the object. No real application for this control in the field of astronomy.

The Mallincam SDI provide you set types of Backlight compensation functions:

- **BLC (Back Light Compensation)**
- **HLC (High Light Compensation**

BLC

This **B**ack **L**ight **C**ompensation control helps counter balance the screen image by increasing the brightness so that the object (which appears dark against a bright background) can be displayed in more detail.

Selecting the control presents a sub-menu which allows you to change the location and dimensions of an area of interest. You will see the rectangle box change as you adjust the following:

- H-POS
- Y-POS
- H-SIZE
- V-SIZE

HLC

This **H**igh **L**ight **C**ompensation control helps control or mask a bright light source. The bright source will be masked with black when **HLC** is operating.

You are presented with a sub-menu that allows you to make finer adjustments to this control.

You can adjust the **LEVEL** at which the compensation takes place from **0** to **20**. The lower the number the quicker the HLC will start making the black mask over the bright spots on the image.

And you can tell the SDI to make these adjustments all the time or only at Night.

DAY&NIGHT

This control allows you to display the images in Colour or Black and White. This control also has settings to help the camera adjust to low light conditions.

Once you activate this control you will be presented with a sub-menu that allows you to adjust the following settings:

- MODE
- IR LED
- ANTI-SAT
- EXTERN S/W
- AGC THRES
- AGC MARGIN
- DELAY

MODE

The **MODE** control allows you to set the SDI to **COLOR**, or **B&W** (Black and White). The Mallincam SDI also has an **AUTO** setting which will switch between the **COLOR** and **B&W** Mode according to light conditions.

There is also an **EXTERN** setting which is not active in this camera.

Note: **COLOR** will most likely be the setting you will leave the camera in when imaging objects, but if you do change the control to **B&W** you will hear an audible click as the camera internally makes the switch (click will also be heard when switching back to color). You it takes a couple of seconds for the SDI to settle down when performing a **COLOR** to **B&W** shift.

IR-LED

Not available on the Mallincam SDI

ANTI-SAT.

This control runs in conjunction with the IR-Led, but since this Mallincam SDI doesn't have IR LED's, then this control does affect the image (unless looking at an IR source).

EXTERN S/W

Not available on the Mallincam SDI.

AGC THRES

The **DAY&NIGHT** switch depends upon the AGC level that is used to increase the brightness of the image. The higher the value then the darker the image is required to be before the switch takes place.

AGC MARGIN

Defines the difference between the Day-to-Night or Night-to-Day switch based upon the AGC THRES. Higher values increase this distance, thus preventing a continuous Switching

DELAY

You can choose **MIDDLE**, **HIGH**, and **LOW** to set the Delay time for the switching.

WHITE BAL

The White Balance Control allows the SDI to adjust the colour temperature (how vivid the colours are). The SDI needs to determine a reference colour temperature (colour of light source) so that it can determine the other colours on the screen.

The Control gives you're the following settings:

- **AUTO**
- **AUTOext**
- **PRESET**
- **MANUAL**

AUTO

This setting allows the SDI to work within its temperature colour range. IT determines what White Balance output to use by reading the colour information from the whole image. It then adjusts the colour based on the colour temperature radiating from a black portion of the image.

AUTOext

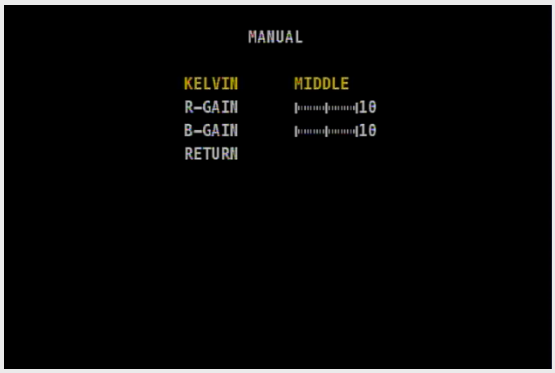
In this Auto Tracking White Balance control, the White Balance of the image is automatically adjusted while the temperature colour is changing (ie during cloudy days).

PRESET

This controls sets the White Balance to the current conditions value and keeps it there. Select this setting and your will see the image adjust colours at it determine the colour temperature. Press the Enter Button to set the image to this color. It you change locations or brightness in the image you may have to **PRESET** it again.

MANUAL

You can use the **MANUAL** setting to fine tune your colours. First set the White Balance by using the **AUTO** or **AUTOext** setting. Then choose **MANUAL** and activate it. You then have control of three adjustments.



- **KELVIN** (MIIDLE, HIGH, LOW)
- **R-GAIN** (W/B for Red 0 to 20)
- **B-GAIN** (W/B for Blue 0 to 20)

The larger the number the more intense of that color will appear in the image. The R-GAIN of 20 would produce a Red image).

The Defaults are at 10.

DNR

Digital Noise Reduction is a control on the SDI that improves the image quality by filtering out the noise which is generated under low light conditions. This control provides 4 possible settings:

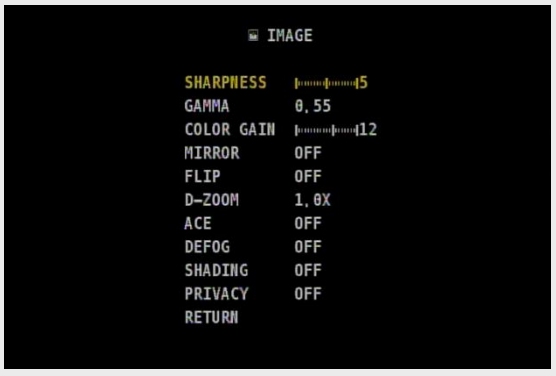
- OFF
- LOW
- MIDDLE
- HIGH

I usually leave this on MIDDLE when imaging planets.

IMAGE

This control allows you to optimize the image quality by allowing you to adjust certain parameters. You will be provided with a sub-menu that provides the following adjustment capabilities:

- SHARPNESS
- GAMMA
- COLOR GAIN
- MIRROR
- FLIP
- D-ZOOM
- ACE
- DEFOG
- SHADING
- PRIVACY



SHARPNESS

This control affect the image sharpness. You have a range from **0** to**10** with **10** being the most aggressive. Too high a value may introduce noise in the image.

GAMMA

This control changes the Gamma Curve of the SDI. You can select GAMMA of **0.45**, **0.5**, **0.55**, **0.6**, and **0.65**. The small the number the brighter the image. Setting **GAMMA** to **0.6** is a great place to start.

COLOR GAIN

This changes the Color Gain of the SDI. You can select a value from **0** to **20**. Using a value of **10** is a great place to start.

MIRROR

This control gives you the ability to mirror (flip) the image horizontally on your screen. Settings are **OFF** for no flip, and **ON** for flip.

FLIP

This control gives you the ability to mirror (flip) the image vertically on your screen. Settings are **OFF** for no flip, and **ON** for flip.

D-ZOOM

This control, the Digital Zoom allows you to digitally zoom into the image. You have the ability to linearly zoom from **1.0x** the original image size to **8.0x** the image size is steps of **0.1**

ACE

This control the **A**daptive **C**ontrast **E**nhancer gives you the ability to enhance the contrast of the image on the screen. You have 4 levels to choose from: **OFF**, **LOW**, **MIDDLE**, and **HIGH**. I find OFF the best choice for astronomical applications.

DEFOG

During seeing conditions with Fog, rain, or even intense luminous conditions have a lower than normal **D**ynamic **R**ange. This control allow the SDI to make adjustment for the lower **DR** level. When this control is activated (set to **ON**), you will be presented with a sub-menu where you can select the **MODE** (**AUTO** or **MANUAL**), and when set to **MANUAL**, the **LEVEL** of adjustments you need the SDI to provide (**LOW**, **MIDDLE**, or **HIGH**).

SHADING

This control helps reduce the brightness difference between the centre of the image and the edges of the image. When activated (set to **ON**), you will be presented with a sub-menu in which you can adjust the range of the **WEIGHT** applied by the SDI to the image from **0%** to **100%**.

PRIVACY

This control has no astronomical applications. When activated (set to **ON**), you will be presented with a sub-menu that allows you to black-out up to **16** (**0** thru **15**) masking regions on your image. You can set the size, location, brightness and the amount of Red or Blue colour to apply to the privacy mask.

MOTION

This control is used to detect the amount of moving object is the field of view. Once activated (set to ON), you will be presented with a sub-menu that will allow you to control how the SDI responds to the detected motion.

SENSITIVITY

Set the range (from **0** to **20**) of sensitivity, the smaller the number the more sensitive the SDI

WINDOW TONE

This sets up the size of the detection zone borders. You can choose from **0** to **6** as the **TONE** size.

DET H_POS

Sets the horizontal location of the Detection Zone box (from **0** to **60**), if you use this control I would leave at **0**.

DET V-POS

Sets the vertical location of the Detection Zone box (from **0** to **40**), if you use this control I would leave at **0**.

DET H-SIZE

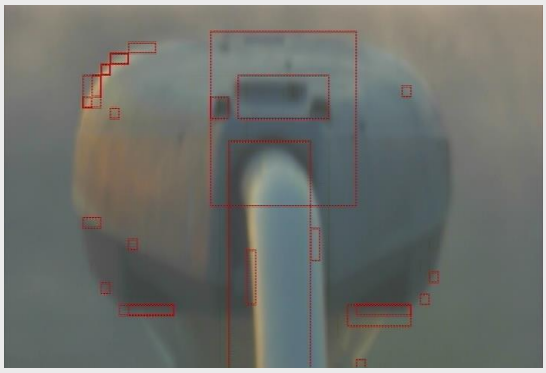
Sets the horizontal size of the Detection Zone box (from **0** to **60**), if you use this control I would leave at **60**.

DET V-SIZE

Sets the horizontal size of the Detection Zone box (from **0** to **40**), if you use this control I would leave at **40**.

MOTION OSD

Determine if the SDI should display red rectangular boxes around parts of the image that are moving. Choices are **ON** or **OFF**.



ALARM

This control is not activated on the SDI.

SYSTEMING

The SYSTEMING control is where so set the parameters for using the Mallincam SDI. You can modify the following settings:

- **COM**
- **IMAGE RANGE**
- **OUTPUT MODE**
- **MONITOR**
- **FRAME RATE**
- **CVBS**
- **LANGUAGE**
- **COLORBAR**
- **RESET**

COM.

The COM control allows to designate a camera number (**0** to **255**) for the SDI along with the communication Baud rate.

Leave these as:

- **COM: 1**
- **BAUDRATE: 9600**

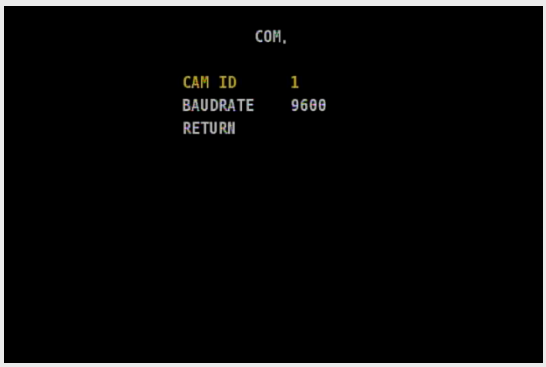


IMAGE RANGE

This Control sets the range of the contrast values that the SDI uses. You are the option of choosing the **FULL** contrast range, or a reduced contrast range using **COMP**, or you can select a **20** levels of contract reduction by using the **USER** option and selecting a **OFFSET** value the sub-menu that appears.

OUTPUT MODE

This control set the SDI Video Output resolution that is used on the SDI Video port on the Mallincam SDI Camera. Set this value to match the SDI input device that you are using. The available choices are:

- **1080P**
- **720P**
- **720P CROP**

You will notice that if you select **720P CROP**, then the CVBS signal will also be adjusted with the outer edges cropped and the inner image zoomed to fill the image window.

MONITOR

Not used for astronomical applications leave at **1**.

FRAME RATE

This sets the frame rate of the video output. Leave at **30 fps** (our capture standard in Canada). Other setting is **25 fps**.

CVSB

This control sets the Video Output Standard. In North America we use **NTSC**, but the SDI camera can be set to **PAL** for our European friends/

LANGUAGE

This control sets the **Language** that the **OSD** uses to display information. Choose the language of your preference.

COLORBAR

This Control turns **ON** or **OFF** the Colour Bar. With the **COLORBAR** set to **ON**, you can determine if the SDI is outputting a signal through the video port without imaging anything.

RESET

This control will reset the Mallincam SDI back to factory default settings.

Press the **RESET** Button until the SDI displays **PUSHING**. The setting are then set to factory defaults.

5. Appendix

Appendix A – Installing the MCV

The MCV-1 and the MCV-1e both come nicely packed in its own see-through packaging. The installation procedures will be the same for either package. The following are the techniques I have used on 4 different computers (3 laptops and 1 desktop). Some are 32 bit and others are 64 bit, all run windows 7. I have not encountered any problems installing this way.

Note

Do some pre-planning to minimize frustration that may occur when Windows gets a bit temperamental. I use both the MallinCam MALLINCAM SDI and the MallinCam Signature exclusively with computer control, so I needed to assign one USB port for my video input (MCV) and another USB port for my serial cable (Belkin USB Serial cable). I even label which port is which on my lap-top (just in case I forget). I will always use the same port for each device, so that I will not have multiple versions of the drivers for multiple USB ports (you are just teasing the windows gods if you mix and match, and they will get even).

The MCV-1 and MCV-1e are heavy and depending upon your computer's manufacturer, the MCV may put some strain on the USB port. Therefore I use a small 6" USB cable extender, and plug the extender into the USB port for and plug the MCV into the other end of the extender.

Step 1

Open the Package

When you open the package you will find:

- 1 mini CD
- 1 User's Manual
- MCV-1 (1e) Do not inset this into **USB port** until instructed

- **Take the instruction booklet and the mini CD and place them on the table. If your computer cannot handle a mini CD (***you cannot physically lock the CD into the centre hole of the CD drive***), then you can down load the software by following the next step**

- **Go to the Mallincam website (www.Mallincam.net) and download the latest drivers for the MCV device in the Support/Software Downloads heading.**

Step 2 ***Insert the MCV-1 or MCV-1e***

*Remember the **USB port** you choose for the **MCV**; you will always use this **USB port** for the **MCV**.*

- The **Windows** will find new hardware and will attempt to load drivers. It will most likely fail on one driver. Don't worry that is why you have the driver installation software.
- Either insert the **CD** or run the program **autorun.exe** in the folder of the file you downloaded.
- When you see the green **USB 2.0 HD HV Grabber** screen, CLICK on the option: **Install Drivers**.

- You may receive a **Windows** warning asking you if you want to allow the installation to run, Click **Yes**.
- Follow the instructions on **the Installation of USB Video/Audio Device Driver** Wizard that is displayed on the desktop.
- The installation takes under a minute. Once complete, you will be presented with a notification windows, click **Finish** with the "**Yes, I want to restart my computer now**" option selected.
- The computer will restart. Login in as you normally would.
- You don't need to install any of the other files from the **HD AV Grabber** installer.

Checking out the MCV-1 or MCV-1e

It is always a good idea to check out the **MCV-1e** to see if it is running correctly after you have done a first time installation.

- Start the **Image** software that you will using to display your MALLINCAM SDI Video image such as: AmpCap, SharpCap, VirtualDub,..)
- In the **Video Device** menu, you should see a **Video Source** called "**USB 2828x Device**". This is the driver for either the **MCV-1** or **MCV-1e** device. This is the one we want. Select it
- Power up your Signature, and you should be able to see the camera's images on the video window of your software.

Oh No, the video is not working correctly, strange stuff is happening and it is not my camera

After you have checked all of the obvious: Power to the MALLINCAM SDI, Software (AMCAP) is pointing to the correct input device on the MCV (remember it has 2 connection types: RCA and SVIDEO).

- Down load the updated **MCV-1** or **MCV-1e** driver from the Mallincam Software Links Site:

Appendix B Connecting to Night Skies Network

Introduction

I found that when I first started connecting to NSN, things started happening too fast for me to keep track of everything at once. So, pre-planning was the most the most crucial step for me. I found that by doing test runs in the comfort of my house allowed me to develop my techniques that work for the equipment and software that I use. Below are the results and steps that I use to broadcast on NSN, feel free to follow them and/or made modification as you deem as necessary.

Note

Computer real-estate will be your nemesis. So, depending upon the size of the monitor (laptop), then number of screens that you are using, then number of software programs that using are simultaneously are using, will dictate how you will manage your windows. I will describe how I have organized my windows under a variety of situations (1 computer, 1 computer with 2 monitors, which software packages am I using, and what am I trying to do this session). Remember, it's all about having fun, and ***time*** and ***patience*** are your best friends (not to mention all the guys and gals, and the Yahoo – MallinCam site :

http://tech.groups.yahoo.com/group/mallincam/messages

One of the most important decisions you will need to make with broadcasting the image of the MALLINCAM SDI is what Video capture software are you going to use. Some simple suggestions:

You can have NSN grab the image directly off your Video Capture Device (MCV), but I find it more convenient to either use a Video Capture Software such as AMCAP, or SMARTCAP to display my image and then capture my screen by using Splitcam, Manycam, or WebCamMax. Even better Splitcam, Manycam, or WebCamMax can both display and pass along the image to NSN without the need of a Video Capture Software. All three have about the same features, some of these have versions that will cost you, but all have a version that is free (reduced functions, advertisements, etc…). My current program of choice is Splitcam (I can live with the Advertisements, but it has some amazing extras such as the ability to change Video Input from Svideo to composite, a must if you use MallinCam's MCV device with a variety of cameras.

Step 1

Plug in the MALLINCAM SDI camera into a USB Port (MCV) on your computer.

Note

Always use the same port for your connected devices. I even mark on my laptop which USB port is for which device. I even use a specific **USB** port for my Video input devices (***MCV, MALLINCAM SDI, Dazzle***), and a specific port for by ***RS232***, ***RS485*** devices. For example if you only have 2 ports, then 1 port is for video input (***MCV***), and the other port is for ***RS485*** control.

Step 2

Start Manycam/Splitcam/WebcamMax

Note

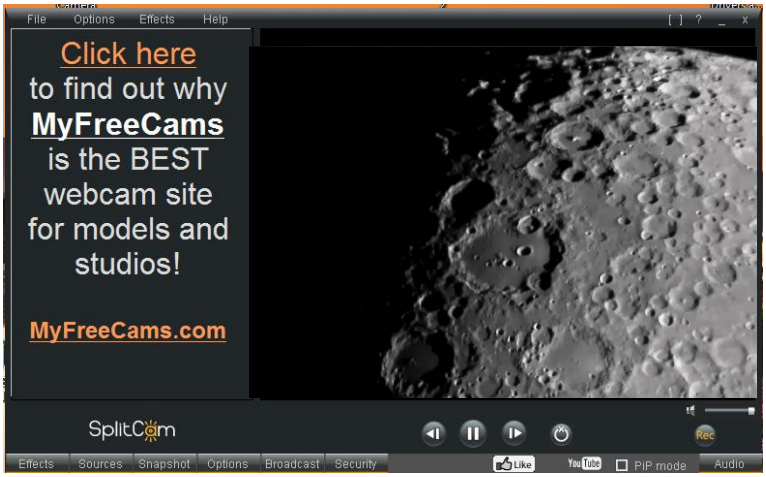
Size the Manycam/Splitcam/WebcamMax window so that you will have room for your Browser to open. If you have a dual monitor system you can slide Manycam/Splitcam/WebcamMax window to the second monitor.

Step 3

Have Manycam/ Splitcam/WebcamMax Choose your Video Driver as the Source

Note

Once connected, you should have the image of what the MALLINCAM SDI is looking at inside the Window of the software. If you are using a third party Video Display Software then have Manycam / Splitcam / WebcamMax choose Desktop Capture as the source.



Step 4

Adjust the Resolution and frames/second (fps) value on Manycam/Splitcam/WebcamMax

Note

This will be trial and error; it all depends upon resolution, bandwidth, and what over members on NSN experience from your broadcasted image. You will end up adjusting both on the Manycam / Splitcam /WebcamMax side as well and on the NSN side to get the best image. For me I start at 800x600 and NSN at 800x600.

Step 5

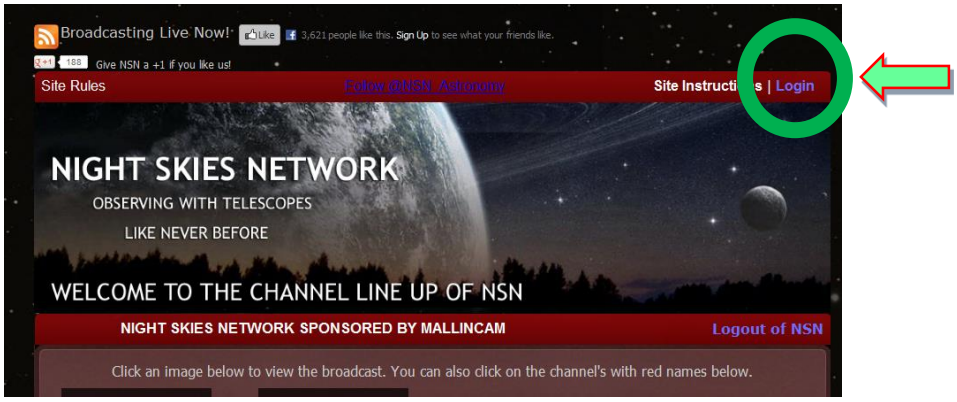
Start your Web Browser of Choice

You may have to play with a number of Browsers to see which one works well with your particular computer setup. I have had success with 3 browsers: ***Chrome***, ***Internet Explorer***, and ***Maxthon***. My current favourite browser to use for NSN broadcast is ***Chrome***.

Step 6

Log into Night Skies Network (NSN)

Have your Web Brower go to the location: http://www.nightskiesnetwork.com/ . Locate and click on the ***BROADCASTERS AND MEMBERS SIGN IN*** button. The next ***Login*** screen will ask you to enter your ***username*** and ***password***. You will next be presented with the ***Channel Line Up*** screen for Night Skies network. Click on the ***Login*** selection on the upper right hand side of the screen.

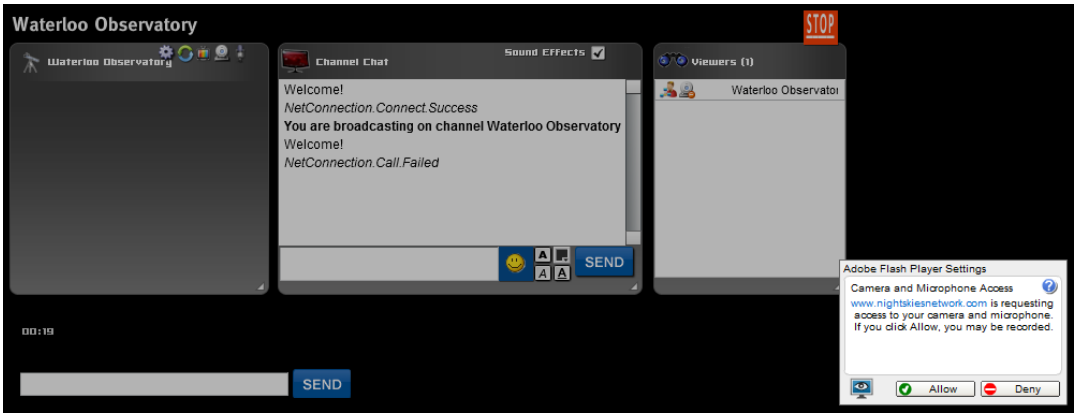

Broadcasting Live Now!
Like
3,621 people like this. Sign Up to see what your friends like.
Give NSN a +1 if you like us!
Site Rules
Follow @NSN_Astronomy
Site Instructions | Login
NIGHT SKIES NETWORK
OBSERVING WITH TELESCOPES
LIKE NEVER BEFORE
WELCOME TO THE CHANNEL LINE UP OF NSN
NIGHT SKIES NETWORK SPONSORED BY MALLINCAM
Logout of NSN
Click an image below to view the broadcast. You can also click on the channel's with red names below.

You will be presented with the ***Channel Launch Sign In*** screen for NSN. Again enter your ***Username*** and ***Password*** and click on ***Publish Channel*** button.

Step 7

Allow Adobe Flash to use your Manycam/Splitcam/WebcamMax or Video Adapter

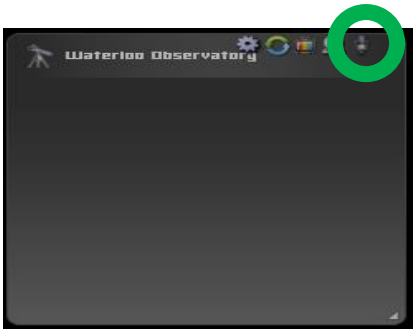
The ***Adobe Flash Player Settings*** window will pop up on your screen asking you for permission to use your camera and your microphone. Select ***Allow***.



Step 8

Turn off your Microphone

Until you have your microphone figured out, it is best to initially turn it off. If you do not, the viewers on NSN may hear a loud buzzing (feedback noise). Later on we will look at using the microphone, but until then I recommend ***CLICKING*** on the little ***microphone symbol*** on the upper right corner of the NSN video display window to disable the microphone.



Step 9

Set a message for the NSN observers

It is a good idea to display a message above the NSN display window, so that the other NSN views understand what you are doing. When initially setting up (which usually takes longer when you are learning), I usually type the message "***Setting Up the Camera***" then ***CLICK*** on the ***SEND*** button to have it displayed.

Note

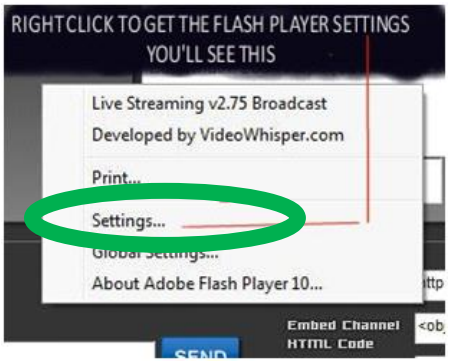
When you are us and running and everything is working as it should, you will change the message to indicate, what telescope, mount, and camera you are using. For that is the most frequently asked question from the NSN viewers.

Step 10

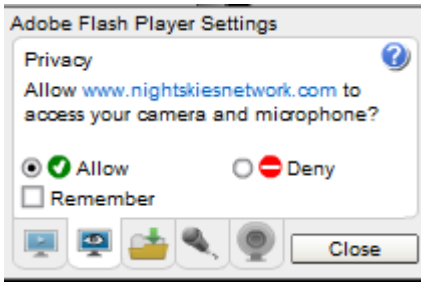
Select the Camera

Now is the time to activate the camera, or in our case have NSN driver point to your Manycam/Splitcam/WebcamMax output or the Video Adapter Driver if you are not using Manycam/Splitcam/WebcamMax.

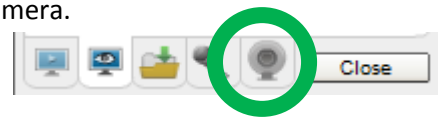
- ***RIGHT CLICK*** inside the NSN Video window to bring up a ***Settings Window***



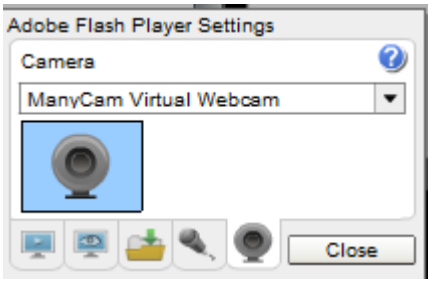
- ***CLICK*** on the ***Settings*** choice and you will be presented with the ***Adobe Flash Player Settings Window.***



- ***CLICK*** on the ***Camera Icon*** and you will be presented with a ***pull down menu*** to select your camera.



- ***CLICK*** on the ***Pull Down*** list to select your camera of choice.



- ***CLICK*** on ***CLOSE*** to Continue.

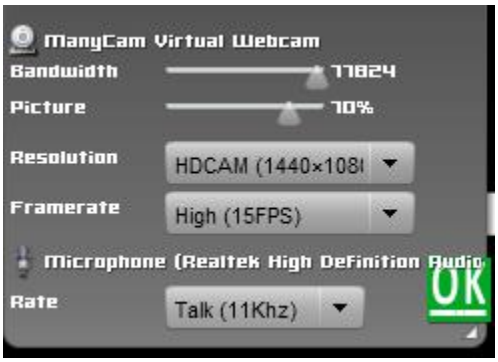
NSN will remember what camera you chose from the last visit. So usually you only have to go through this process whenever you want to change what camera device you would like the ***NSN flash driver*** to use.

Step 11 ***Choose your Camera Settings***

We will now select the settings for our camera. We have the option of changing: The ***Bandwidth***, ***Picture***, ***Resolution***, ***Framerate***, and even the ***microphone rate*** (when you

are ready). The changes will **not be activated** until you ***CLICK*** on the Green ***OK*** symbol in the window.

- ***LEFT CLICK*** inside the NSN video Window to bring up the ***Camera Settings Window*****.**



- ***Use the sliders*** for ***Band Width*** and ***Picture*** values. I usually have both of my sliders way on the right. Over time you will find the sweet spot for your system.

- Select your ***Resolution*** from the ***Pull Down Menu***. Start at 800x600 and move up from there. Play with these to see what settings the NSN viewers say is the best.

- Select your ***Frame Rate***. From its ***Pull Down Menu***. I usually leave it at 15 fps, but I have used 30 fps at times. Again trial and error for your system.

- ***CLICK*** on the green ***OK*** symbol to accept these settings

That's it, you are done. If everything is working well and the Window's gods are in a good mood, you should be broadcasting whatever object the MALLINCAM SDI is capturing. You should now enter another Message and ***SEND*** it out to indicate what system you are using and what object you are viewing.

Note

There is a time delay on what you say (if you have you microphone activated) and do on your computer as compared to what others see (and hear) on the NSN broadcast.

You will freeze (and I don't mean like what Chris does when he broadcasts in winter till 3am), I mean from time to time your NSN connection will freeze for no apparent reason. It happens to us all. When this happens, you can simply terminate the Web browser program (Ctrl –Alt-Del). Then restart your browser and Log back into NSN. This usual is a very quick process. But, sometime we all have to restart our computer (this takes longer for we need to power down hardware and software) and reactivate everything before login back in. Don't worry, the NSN viewers sense what is happening and will keep the conversations going while waiting for you to come back on.

Don't be afraid to ask for advice by typing in on the Video chat window, as we are all learning and are willing to assist whenever we can.

When ready, try activating the microphone (click on the microphone symbol). Other will let you know if they can hear you, or if there is noise. Remember there are settings for the microphone in the camera settings window.

I have become hooked on ***Splitcam***. With my dual monitor system I have Splitcam grab my Video device (***USB 2828x Device***) directly. Splitcam can adjust brightness, contrast, etc. I can also call up the ***USB 2828x Device*** control panel (located in ***File/Video settings***) which gives you some more control of the MCV's image output or by using the Options Tab thus allowing you to change the brightness contrast, sharpness over and above what the MALLINCAM SDI camera does. Since I place Splitcam on its own monitor (the second monitor), I can make it full screen to see all the detail, while my fist monitor has the NSN connection screen with its preview and chat window.

When you are finished with your session, you simply say your good nights to the crowd of NSN viewers to let them know that your session is ending. ***CLICK*** on the red ***STOP*** button on your NSN Window and NSN will shut down your channel and you can power down your system and call it an evening (It won't force the NSN viewers off the channel and some viewers will continue chatting long after you have gone to bed).

Appendix C – Connecting Serial to Mallincam SDI

If you are like me, you do not like pushing the buttons on the back of the Camera. If that is the case, then you need to create a connection path between your computer and the RS485 port on the Mallincam SDI. Once that path is create, you can then control the camera thru software (I create a simple piece of software to do this. See below).

What you Need

Either a USB to RS485 Adapter or USB to RS232 Cable

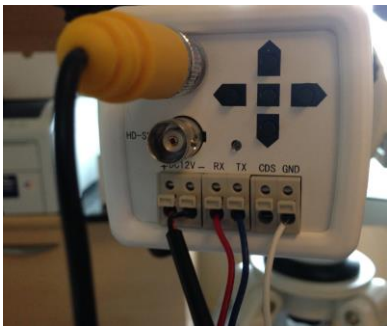
If you are using a USB to RS232 Cable, you will also require a RS232 to SR454 adapter.

A cable of suitable length with 3 wires.

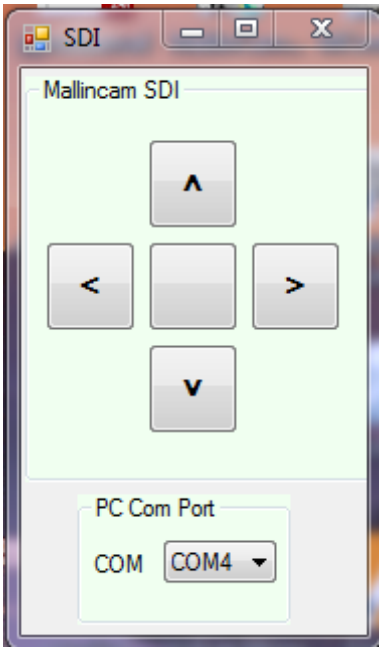
What to Do

All you need to do is connect three wires from the RS485 end of the adapter to the RS485 plugs on the back of the Mallicam SDI

- Connect a wire from the +Rx of the adapter to the +Rx of the SDI
- Connect a wire from the –Rx of the adapter to the-Rx of the SDI
- Connect a wire from the Gnd of the adapter to the Gnd of the SDI



All you need now is a suitable piece of software to control the Mallincam SDI. If you visit the Mallincam Site, Rock will be providing a link to the free piece of software.



Appendix D – Displaying SDI on your Computer

SDI is a professional bandwidth video output protocol, and as such requires special hardware to get the signal into the computer. There are two devices most commonly used with SDI:

- BlackMagic Ultrastudio SDI
- Magewell SDI Dongle

Both products recommend using USB3, but only the Magewell product can be connected to and use a USB2 port (it will automatically maximize the thru-put for the USB2 connection.

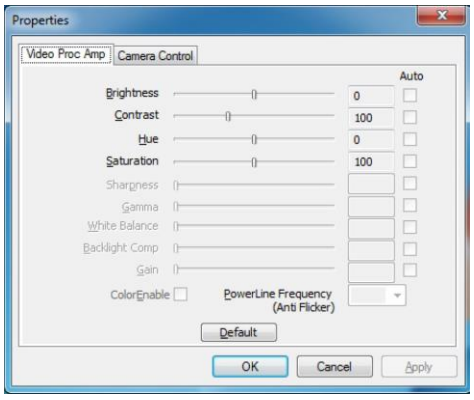
Magewell SDI Dongle (XI100DUSB-SDI)

This product is plug-and-play, so all you need to do is plug in the dongle, it will install what it need automatically (like every USB device). Then you can use the product.

- Simply connect a SDI cable from the SDI port on the Mallincam to the SDI input on the Magewell.
- Start your favourite piece of Video display software, like AMCAP
- Have AMCAP point to XI100DUSB-SDI Video

That's it.

If your Video Display software has a **Filter Output** or **Filter PIN**, then you can adjust the Brightness, Contrast, Hue, and Saturation.



BlackMagic UltraStudio SDI

Visit the BlackMagic Web-site for compatible computer system, as there are very strict requirements with this device.

You will need to install the product by following the instructions provided with the BlackMagic Ultrastudio.

Note: you will need to ensure that the frame rate and resolution match in the Mallincam SDI, BlackMagic Control Panel, and Video software for the image to be seen.

- Connect the USB3 Cable from the Ultrastudio to a USB2 Port on the Computer
- Connect the SDI cable from the back of the Mallincam to the SDI IN on the Ultrastudio
- Start the Video Software of your choice, such as AMCAP
- Look for the BLACKMAGIC WDM driver or the Decklink driver on the Video Source list, you may have to try both drivers to see which one works with your video software.

It takes a bit of trial and error to match everything with the Blackmagic Ultrastudio, but once done, you are good to go.

Appendix E – First Aid for the Mallincam SDI

The Image from the MALLINCAM SDI is jumping all over the place

Diagnosis: The camera is not getting a proper video signal.

Cure: Check to make sure that the correct type of video cable is snuggly connected from the Mallincam SDI to the Computer.

Are you using the SDI output on a composite camera?

Is the SDI output resolution 1080p vs 720p matching the expected input resolution (including fps)?

When I have my Video Software connect to my Mallincam through my MCV-1 adapter I only see a Blue screen.

Diagnosis: The MCV-1 or other adapters can have multiple video input connections. For example the MCV-1 has both composite and S-video. The cause of this symptom is that MallinCam is looking at one of those input ports, while the camera is sending the image through the other. Your Video Display software then just gives a Blue screen to say that I see nothing at the MCV-1 source.

Cure: Set the video to use the Composite Source on the x2828 (MCV) video driver and

Appendix F – Settings Template

Menu Parameter	Setting	Comments
1. LENS		
ELC	NORMAL	
2. Exposure		
BRIGHTNESS	10	This gives wiggle room
SHUTTER	Manual at 1/2000	Starting point, depends on object
SENSE UP	OFF	Not used in Manual Shutter
AGC	5	This gives wiggle room
3. DNR		
SETTING	Middle	Personal Preference
4. IMAGE		
SHARPNESS	15	This gives wiggle room
GAMMA	0.5	Depends on Monitor
COLOR GAIN	10	This gives wiggle room
ACE	OFF	Personal Preference
5. Day & Night		
D&N Mode	COLOR	I like Color
6. White Balance		
AUTO	Choose this	
AUTOext		
MANUAL		
7. System		
OUTPUT MODE	1080p	Full Screen for both SDI and Composite
8. Other		

Menu Parameter	Setting	Comments
1. LENS		
ELC		
2. Exposure		
BRIGHTNESS		
SHUTTER		
SENSE UP		
AGC		
3. DNR		
SETTING		
4. IMAGE		
SHARPNESS		
GAMMA		
COLOR GAIN		
ACE		
5. Day & Night		
D&N Mode		
6. White Balance		
AUTO		
AUTOext		
MANUAL		
7. System		
OUTPUT MODE		
8. Other		

Appendix G – Notes